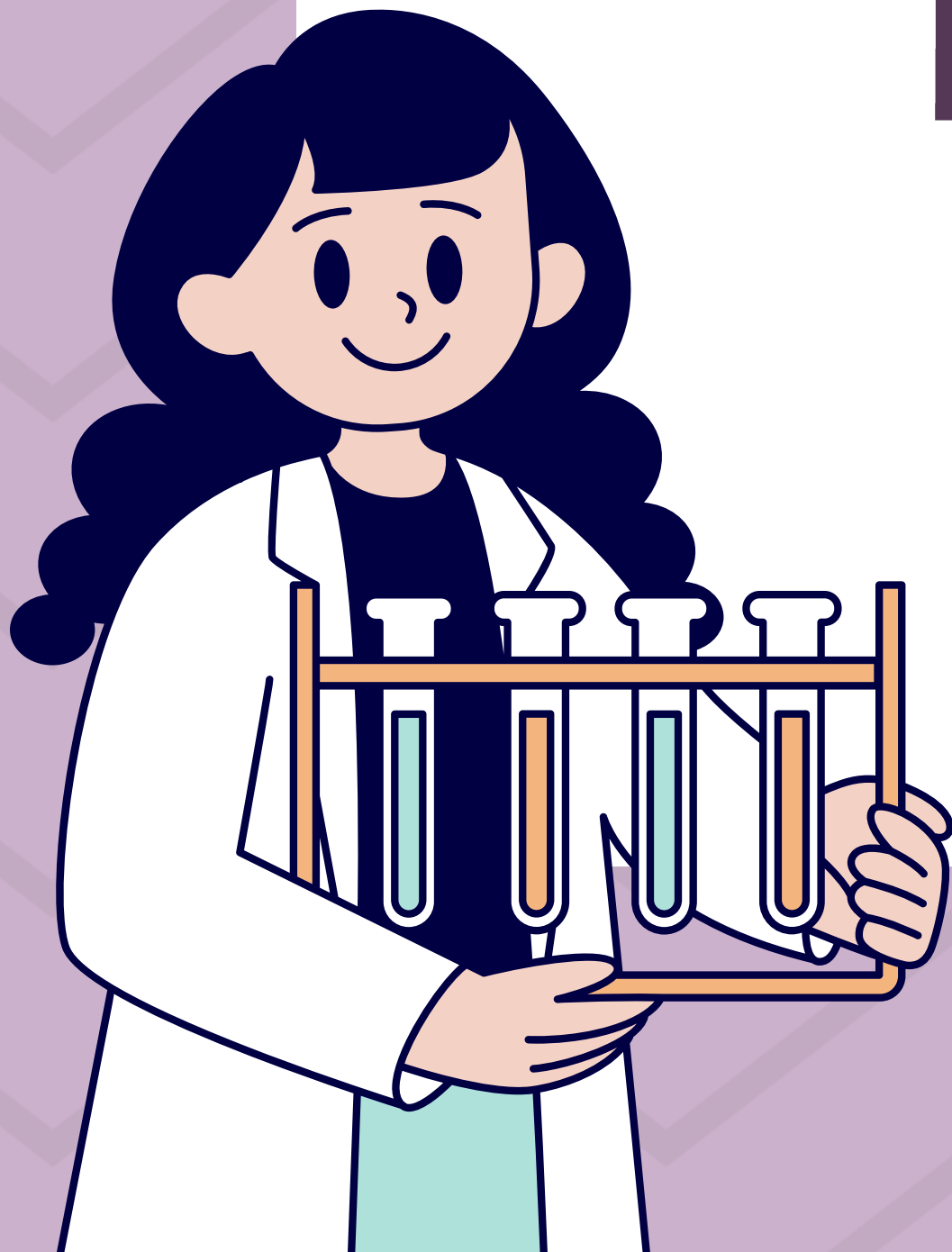


FIRST STEP: SHAPE YOUR BODY. MOSES CLINIC, JUNE 5, 2024

THE "THRIFTY GENE"

FAT CELLS AND HORMONES
INFLUENCING WEIGHT



LOSING WEIGHT IS NOT EASY

Influenced by factors including

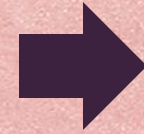
- Behavioral
 - Nutrition
 - Exercise
 - Sleep
 - Stress Levels
- Biological
 - Medications
 - Medical Conditions
- Genetic
- Environmental
- Social

All of these and more affect the systems that regulate weight!



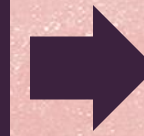
THE PAST

- Famine-feast cycle
 - Decades-long famines
 - Shorter periods of food availability
- Large amounts of physical exercise



OUR BODIES

- Wanted to be thrifty with how much energy was spent on daily activities and save energy for times of low food availability

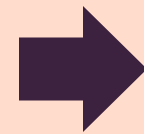


BIOLOGY

- Adapted to the stress of famine-feast cycling by developing a gene that used nutrients more efficiently and stored extra nutrients

THE PRESENT

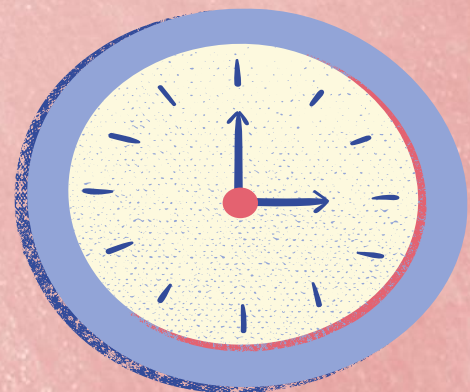
- Lots of food in developed countries
 - High fat
 - High sugar
 - Highly processed
- Small amounts of physical exercise

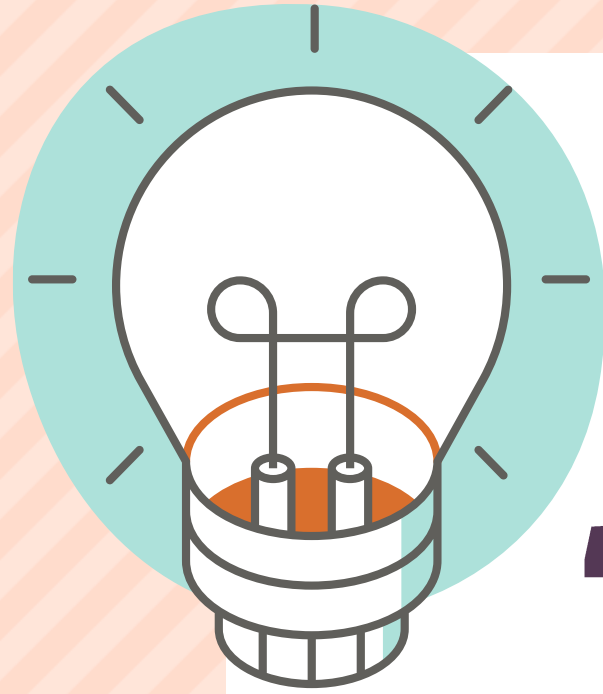


OUR BODIES

- Continue to store nutrients as fat

THRIFTY GENE HYPOTHESIS





THERE IS NO "THRIFTY GENE"

While research is being done on candidates for the "thrifty gene", a singular gene that predisposes people to obesity has not been definitively identified.

Instead, various factors including our actions, our genetics, and systems of hormones, cells, and signals all contribute to our weight.



WHEN WE EAT



DAILY ACTIVITIES

Breathing, living, and going about our days all require energy

- Most of our energy is from macronutrients like glucose, amino acids, and lipids
- As we do things, low levels of glucose in the blood cause a hunger signal to be sent to our brains

DISTRIBUTION

The nutrients from digestion are absorbed by our bodies and used to build and repair our bodies

DIGESTION

Starting from our mouths, food is broken down

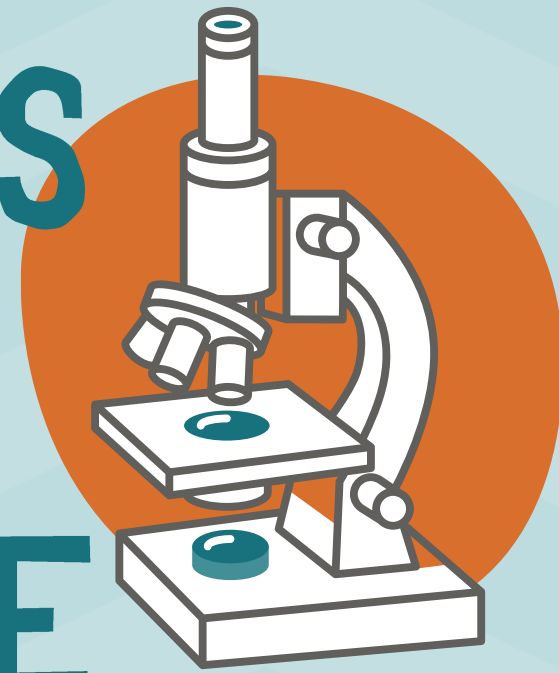
- Carbohydrates -> glucose
- Protein -> amino acids
- Fat -> lipids
- Vegetables and Fruits -> fiber, minerals, and vitamins

FAT CELLS

Fat cells, or adipose tissue, stores extra energy. The number of fat cells we have is relatively constant

- Fat cells grow and shrink with how much they are storing
 - Glucose -> glycogen in muscles and lipids in fat cells
 - Amino acids are turned into lipids and stored in fat cells
 - Lipids are stored directly

HORMONES THAT INFLUENCE HUNGER

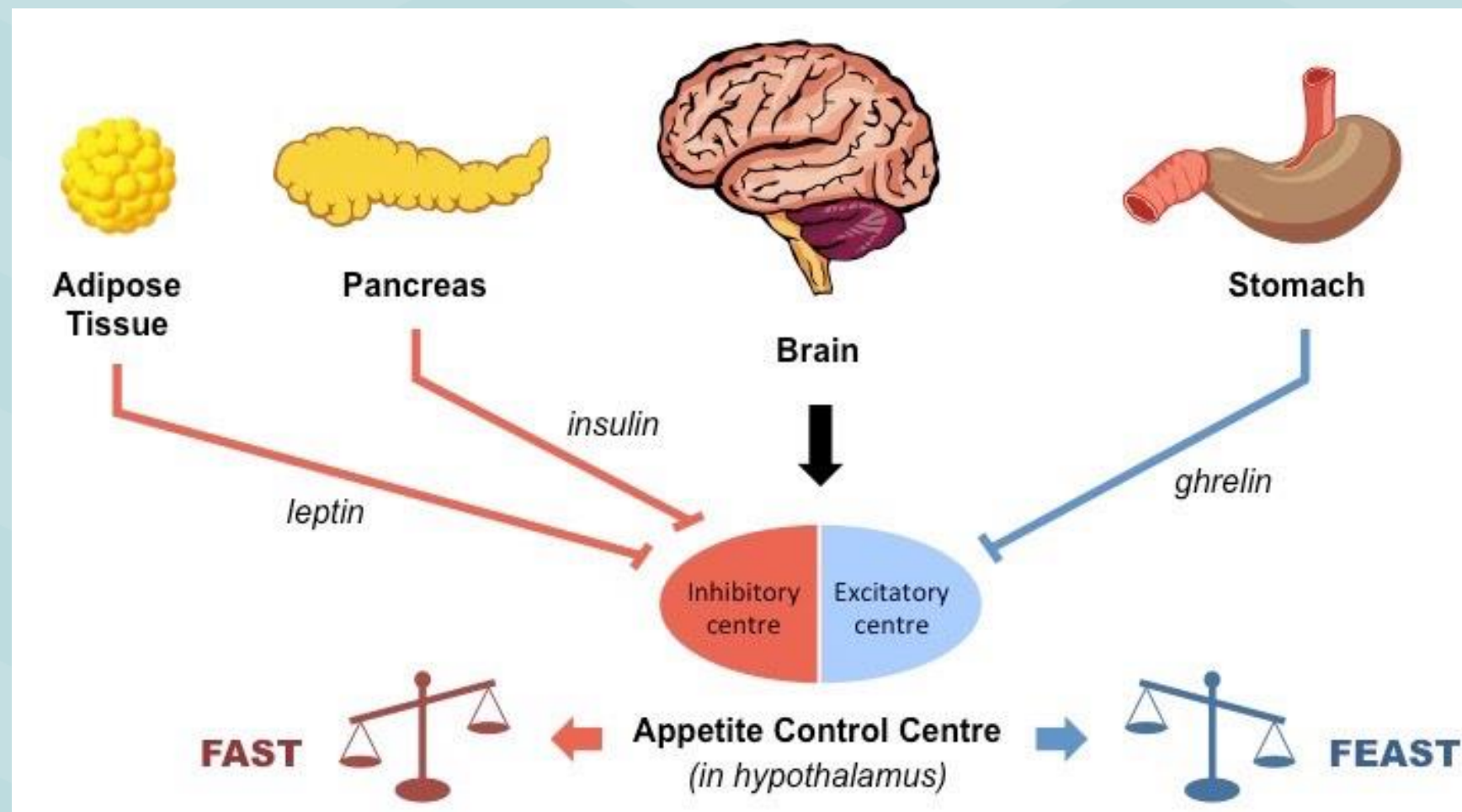


HUNGRY

- Ghrelin
 - When the stomach is empty, it produces ghrelin and sends it to the brain. This creates a sense of hunger

FULL

- Leptin
 - As fat cells grow, they release and send leptin to the brain, decreasing our long-term sense of hunger
- Insulin
 - Helps to regulate the use and storage of glucose
- Amylin
- Adiponectin
- Cholecystikinin (CCK)
- Glucagon-Like Peptide 1 (GLP-1)
- Peptide YY (PYY)



HOMEOSTASIS

SLOW AND STEADY IS BEST

EATING LESS

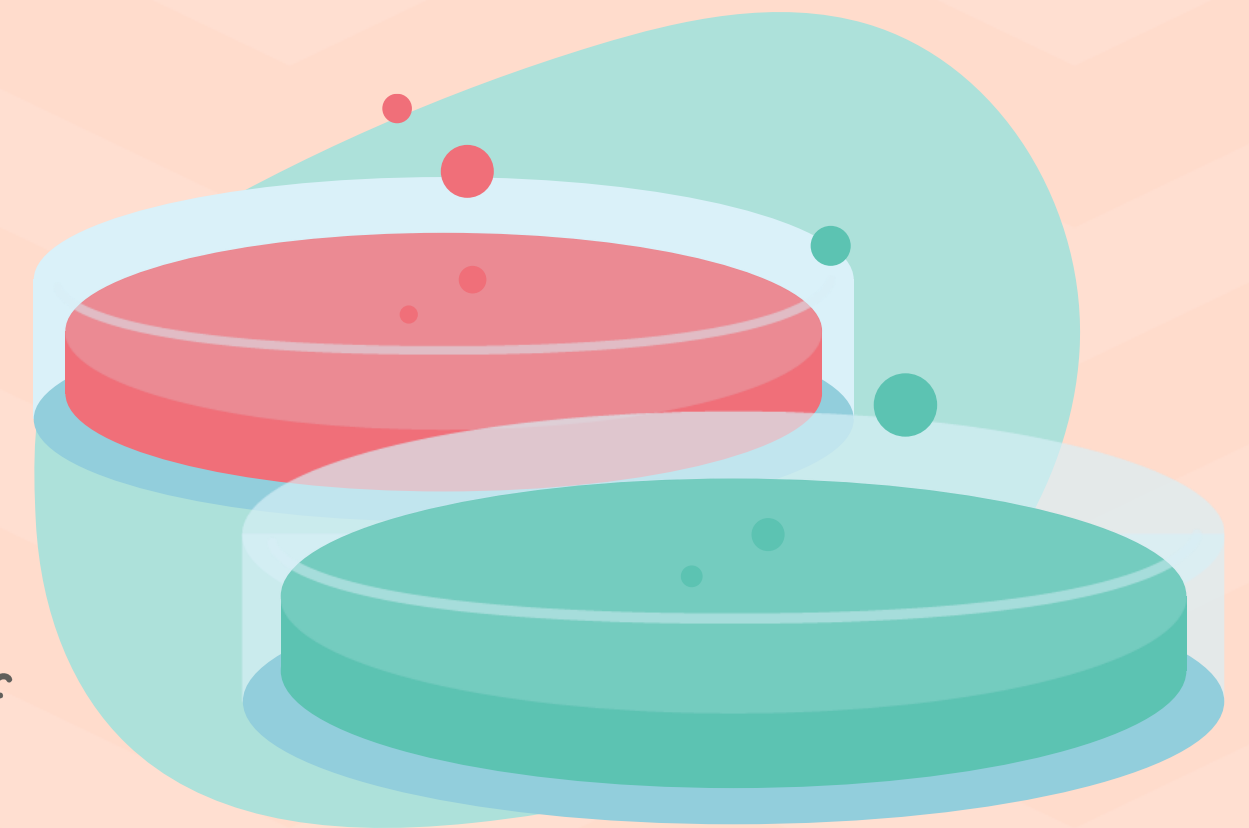
- Water weight is lost first
- Feelings of hunger and tiredness
- If too many calories are taken away over a long period, the body starts to think it is starving and starts to save energy

EXERCISING MORE

- Proper form is important
- Strength and endurance are built over time
- If we exercise too much over a short period of time, the body becomes stressed and is more likely to get injured

RESTING METABOLIC RATE

- The smallest amount of energy our bodies need to function and survive if we just laid down in bed all day



FINDING A BALANCE



SOME FAT IS ACTUALLY GOOD FOR US

- Keep our bodies warm by generating heat
 - Insulates out soft organs
 - Fat cells secrete molecules like leptin to regulate hunger
 - Help regulate energy, menstrual cycles, and reproduction
-
-

KEY TAKEAWAYS

- Lots of factors play a role in how we gain and lose weight
- How easily we gain or lose weight is not determined by a single "thrifty gene", but by a mix of our body's functions, our actions, and our circumstances
- Fat cells grow and shrink as they store extra energy
- Hormones like ghrelin, insulin, and leptin play key roles in regulating hunger and glucose levels
- Losing weight can be a slow process, but fat in and of itself is not purely a bad thing



KEY TAKEAWAYS

Slow and steady weight loss is best. Try not be too hard on yourself if you break your streak by eating something unhealthy or find that you are not losing weight as fast as you would like. There are a lot of factors we can't control when it comes to our weight, we can only do our best.

Habits are things you do normally, not all the time. More than losing weight, we are trying to build healthy lifestyles and find joy in the little wins. We're all in this together!



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Thanks for listening!

Any questions? Please feel free to ask.

